

BOEING

M A G A Z I N E



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ON OUR COVER—Fast, fast, fast relief is given to electronic manufacturing by photo negatives of circuits. Two articles in this issue describe modern electronics work, grown to big business at Boeing; please see pages 3, 4, 5 and page 11.

PHOTO CREDITS—By Wingett (cover, 3, 4, 5, 14); Southern California Gas (7); R E A Express (8, 9); Tom Cusick (10, 11); Vernon Manion (11); Vernon Rutledge (14).



THE **BOEING** COMPANY

HEADQUARTERS OFFICES

7755 East Marginal Way Seattle, Washington

➤ Aim of Boeing's new military transport development department is to explore military needs both present and future. This definition includes the possibility of a supersonic transport and even transports which might fly beyond the earth's atmosphere.

The new department was formed in July as part of the Transport Division at Renton, Washington. Maynard Pennell, formerly director of engineering for the division, heads the new department. He has held key positions throughout development of the military KC-135 jet tanker-transport, the C-135 jet transport and the civil jetliner family.

➤ Orbiting of payloads weighing more than 500,000 pounds is being considered in a study by the Aero-Space Division. In July the division received three contracts for studying the use of solid-fuel rockets to boost manned space vehicles into orbit. The Air Force Space Systems Division and the National Aeronautics and Space Administration's George C. Marshall Space Flight Center awarded the contracts as extensions of an earlier NASA-funded study.

No hardware is involved. The contracts cover design studies of space vehicles using clusters of 156-inch-diameter or 260-inch-diameter motors. Launchpad and other ground-system requirements, and techniques of assembling rocket clusters, are included in the studies.

Findings of all three contracts will be reported in full to both the Air Force and NASA.

➤ "From biplanes to ballistic bombers" is the catch phrase this month at the Wichita end of Boeing's Military Aircraft Systems Division, as its work force celebrates the 35th anniversary of the organization. In September, 1927 the Kansas plant got under way as the Stearman Aircraft Company with some 20 employees engaged in stick-and-wire assembly of C-3B open-cockpit fabric-covered biplanes. Their skills flourished and this month some 20,000 Boeing employees in Wichita are about to deliver their 467th B-52 Stratofortress to the Strategic Air Command. In addition to the B-52s, more than 14,000 trainers, B-29s, gliders and B-47s have been built at the Wichita plant. It is the largest industry in Kansas. ➤



Tray of resistors is loaded into oven for aging at 100 degrees C.

ELECTRONICS COME OF AGE

By GREGG REYNOLDS

AT JUST ABOUT seventeen, Boeing's stepchild not only is out of the attic but occupying the guest room, with more than 9,000 people keeping its hair combed.

The stepchild turned into a corporate pride-and-joy is the science and practice of electronics; and the reason for its present popularity is reasonably simple: electronics now account for more than 30 per cent of the business of the Aero-Space Division, Boeing's largest.

The 9,000-plus electronics employees devote their energies to such diverse projects as ground support systems for Minuteman missiles, soon-to-be-in-space compo-

nents for the X-20 (Dyna-Soar) space glider and sea-going systems for hydrofoil vessels. Research and design efforts include electronic countermeasures, radar-optical systems, miniaturized equipment, infrared studies, radio navigation aids and automatic checking equipment for electrical systems.

Not too many small boys daydream of becoming dentists; and Boeing, the bomber-builder of the early nineteen forties, had no great corporate ambition to produce small black boxes which require protection even from a workman's falling hair and the oils in his honest perspiration. But there is a need for dentists which eventually attracts even adventurous-minded

boys; and the need for electronics capabilities became obvious to airplane builders the moment they stuck a tentative toe into the untried waters of rocketry, jet propulsion and space exploration.

Two facts spurred the original Boeing electronics effort and continue true today: complete systems, rather than individual products, are essential both for today's vehicles and modern weaponry; the designer of a complete system must be prepared to design and build whatever components, be they bolts or black boxes, he cannot buy.

Thus, Boeing was catapulted into electronics by the need of support systems for its first—and now nearly forgotten—guided missile, the



Boeing-developed semi-automatic machine helps check completed circuit-board assemblies.

TV-like machine shows picture and describes (by ear phone) necessary steps as technician assembles unit.



Plastic bags keep out dust during an assembly.



GAPA, built from 1945 through 1949. This 1500-mile-per-hour Ground to Air Pilotless Aircraft required precision electronics equipment not available anywhere. So Boeing built its own—and the step-child department was installed in the company attic. Its 17-year progress from obscurity has been steady, as the company found new electronic needs in military and civilian jet aircraft, Bomarc Interceptor Missile systems, the presently-featured Minuteman Intercontinental Ballistic Missiles, Dyna-Soar and products still in the planning stages.

For Boeing from the first, the glamour of electronics research has gone hand-in-hand with the no-frills manufacturing which ties the science to the completed product. Today Boeing electronic activities cut across program lines, producing materials for most of the company's varied products. Company policy still calls for purchasing from vendors whenever it is more efficient and economical than setting up a manufacturing program. Thus, basic parts such as transistors and semi-conductors generally are purchased.

One manufacturing manager describes it this way, "Whether you're building boats, airplanes or electronics, your task is essentially the same and many of the same fundamentals apply. One of our strong points is the proven ability to assimilate new techniques and materials without wasting valuable time."

Differences among manufacturing electronics hardware and aircraft or missiles include even more rigidly controlled assembly processes; greater likelihood of design revisions caused by rapidly advancing technology; increased testing requirements calling for extensive checks during and after assembly; overlapping of research and development work and manufacturing, as well as the much larger number of units produced.

In the case of Minuteman ground support equipment, which accounts for more than half of Boeing electronics work, these requirements assume tremendous importance. The Minuteman weapon system is pred-

icated on high reliability. Much of its electronic support equipment must be capable of remaining in top working condition without maintenance for long periods. Reliability becomes the watchword from design through installation of the finished item at the missile base.

During the manufacturing phase it means most assembly and test of components is accomplished in a specially designed building on the east side of Boeing Field, Seattle, where the air is kept dust-free and at constant moisture and temperature levels. Technicians working in controlled environment areas routinely vacuum the soles of their shoes before entering and wear laboratory frocks over their street clothes. While performing some critical tasks they complete their garb with white gloves and hats which prevent contamination of precision parts by skin oils or falling hair.

Paradoxically, this building, called the Electronics Manufacturing Facility, is the site of another phase of Aero-Space Division electronics work which to the casual observer might pass for a wiring shop in any electrical products plant in the nation. In this section personnel wearing everyday work clothes assemble complicated networks of wiring for a variety of electronics test gear and systems. Although not as glamorous as the work performed in the nearby "clean" and "super clean" rooms by specially dressed technicians, excellence is the standard here, too. Every item produced is checked and re-checked before pronounced up to quality.

Other phases of electronics work are conducted at the company's Missile Production Center located about a mile north of Boeing Plant II in Seattle. Products manufactured here vary from ground and airborne missile equipment to precision-made cabinets to hold the complex gear. One of the largest electrical-electronic cable shops in the industry also is here. Still more electronics facilities are in the Plant II complex and Developmental Center near the south end of Boeing Field. Research and development efforts constitute the major

portion of work in these two areas.

Testing plays a vital role in electronics activities. At the Electronic Manufacturing Facility Building, small components such as capacitors, resistors and diodes are stored by the thousands for use in circuitry assemblies.

These parts are first tested by their manufacturers before shipment to Boeing. Upon arrival at the plant they begin Boeing tests. At any given time, approximately 250,000 of these electronic building blocks are undergoing aging and other testing processes to see if they meet specifications after exposure to the elements of time and use. Some are aged for more than two weeks in heated ovens. If they pass this rigorous test the odds are high that they will perform as required.

During this phase of testing, each part destined for use in a high-reliability system such as Minuteman receives its own serial number which is permanently stamped on

it (in many instances the number is nearly as long as the part itself). The number is significant because through a computer filing system it is possible to trace the location of a given part even after it has been assembled into a large system and delivered to the customer.

In essence, electronic testing differs from other types in that it continues long past the point where others stop. Most test programs include a general structural test of the first item with inspections of subsequent units. Electronics tests begin with a detailed check of the first unit and continue through inspection as well as testing of all subsequent units.

The Aero-Space Division's varied electronics capability is constantly advancing through programs, research projects and studies conducted within the division. This strength represents a vital part of the company's ability to successfully compete for aerospace business. 

Potting and molding of electrical connectors to cable jackets is done at the Missile Production Center cable shop.



Potential widespread use is seen for new

NATURAL-GAS TURBINE

By ALLEN HOBBS

TWO REMARKABLE new units called Boeing Turbo-Power Centers are supplying electricity, heat and air conditioning to an office in Downey, California.

Key items in the installation are two Boeing gas turbine engines which burn natural gas instead of the liquid fuel ordinarily used.

This evaluation project went into operation last month in a Southern

California Gas Company building. Sponsored jointly by Southern California Gas and Boeing, the installation will be monitored for a year by personnel of both companies.

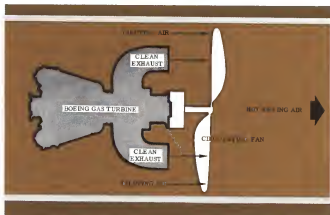
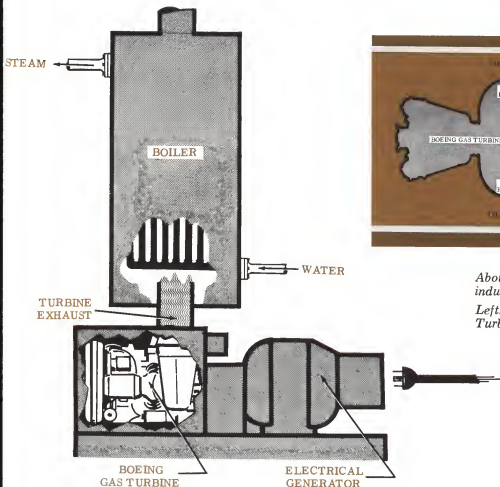
Boeing's Industrial Products Division manufactures the turbines in Seattle and already has made successful endurance tests of them with natural gas fuel. Tests in Seattle are continuing.

In the California installation, the turbines drive generators which sup-

ply electricity. Exhausts from the turbines are piped through boilers to make steam. This steam may be used for heat in winter, or to operate an air-conditioning unit which provides cool air in summer.

Using the exhaust heat gives the powerplants a thermal efficiency of 60 to 75 per cent—the percentage of fuel energy converted to useful work.

Model 502 turbines are used in the installation. Each delivers 200



Above: turbine dryer has wide range of industrial applications.

Left: cutaway shows some details of the Turbo-Power Center.



Southern California Gas Company gas-turbine installation is readied for operation. Flooring over pipes will be installed.

horsepower and is capable of continuous operation. One turbine-generator-boiler unit is running at all times. A second identical unit starts automatically whenever the building's electrical load climbs above a preselected level. Both units then share the electrical demand. When the electrical load drops, as at the end of the day when the office closes, one turbine automatically shuts down.

Each turbine has an output-shaft speed of 3,600 rpm. They drive 60-cycle, three-phase, 160-kw generators, to supply electricity suitable for wiring and electrical equipment already in the building.

If a new building were being constructed, costs could be lowered by installing a 420-cycle system. Fewer lights and less wiring would provide the same amount of illumination as the more costly 60-cycle system. Lights would last longer.

Each exhaust-heat boiler will produce 2,400 pounds of steam per hour at a pressure of 15 pounds per

square inch, when a turbine is running. This is ample to heat the building, which has 31,000 square feet of floor space, during the area's coldest winter. In summer, this amount of steam will operate a 140-ton absorption air conditioner.

If the year-long test of the installation proves it be economical and otherwise satisfactory, there is a large potential market for the units in areas where the cost of electricity is high and natural gas is available.


Cost figures accumulated in the test run also will be used to determine the economy of other applications of Boeing turbines fueled by natural gas. Use of the engine's shaft power and exhaust heat in industrial-drying work would have a thermal efficiency of more than 95 per cent.

Vincent Moore, chief engineer of the Industrial Products Division, comments, "The gas turbine, burning natural gas, is particularly attractive for drying applications. It

offers not only compactness, simplicity, freedom from vibration and ease of installation, but also its exhaust products have the purity of a gas flame, in sharp contrast to the lubricating-oil contamination found in reciprocating-engine exhaust.

"The exhaust heat therefore can be used directly in the drying process. Because of the high over-all thermal efficiency of the system, there is a great potential in cost savings over current drying methods."

For drying applications requiring air of lower temperature than the direct exhaust, cool air would be ducted around the turbine and mixed with the hot exhaust. An exhaust-heat boiler would be used for processes requiring steam. In all cases the shaft power of the turbine would drive equipment such as circulating fans or conveyor belts.

Industries which could use the turbine dryer include pulp and paper manufacture, brick making, soap manufacture, gypsum processing and food processing. 



Air Express celebrates its 35th anniversary.

ANYTHING GOES

By CHESTER CHATFIELD

BACK IN 1927 the American Railway Express Company took a look at shipping by air and decided it could be a business instead of a publicity gimmick. Men thought big in those boom days of the late 20s—maybe even big enough to foresee Air Express revenue of some \$51,000,000 annually by 1961.

Cal Coolidge was in the White House and all was well with the world when scheduled transcontinental Air Express got off the

ground on September 1, 1927. At least four shoebox-size packages were loaded in the freight compartment of a Boeing 40, operated by Boeing Air Transport between San Francisco and Chicago.

Flashbulbs would have popped, but they hadn't been invented yet. Fortunately sunshine and optimism were everywhere, leading photographers to record the event.

The nice thing about Air Express was that it worked. From a cautious beginning when most air shipments were made to meet emergencies, businessmen moved on to the happy

discovery that here was a way to make higher profits on a lot of items.

The Air Express people learned some things also. They started out with a published list of cargo they would not accept, including any item in excess of 200 pounds. Today anything goes (almost anything, hastily amends the Air Express man—he will take a crated crocodile, but is doubtful about elephants).

Air Express is a service offered jointly by R E A Express, which provides the ground handling, and



In early days an airplane, train and truck could meet to transfer Air Express shipments.



Boeing 40 is loaded on first day of Air Express operation, September 1, 1927.



37 U.S. scheduled airlines. The express company picks up the package from the shipper, in any one of 23,000 towns across the nation, and it goes by the fastest means all the way to the door of the receiver. The package may move part way by truck or railroad, but most likely will travel the greatest distance by Boeing jet aircraft, at something near 600 miles an hour. Often in New York delivery is further speeded by a ride on one of New York Airways' Boeing Vertol helicopters.

The whole 35-year history of Air


Express is linked with Boeing transport aircraft. Present operations of Air Express are carried on 24 hours a day, 7 days a week, in all 50 of the United States and to and from Canada and Puerto Rico.

Shipments go out on the first flight having capacity available, regardless of airline. More than 10,000 daily flight departures carry air express. After passengers and mail, express has top priority over all other cargo.

Many articles shipped by Air Express are perishable, such as radioactive isotopes, biologicals,

serums, Hawaiian orchids and Maine lobsters.

One classification listed as perishable is surprising—women's style apparel. A new hat or dress placed on display a day, or hours, ahead of a competitor gets the buyer's attention first and often commands a premium. Flowers on the hat are not perishable, but the price of it may be.

The adaptability of Air Express men is incalculable. They have sent word that their refusal to fly an elephant is not absolute. They might consider a small one. 

Fast solutions to
problems are furnished by

**DESIGN
ANSWER
SERVICE**



Loren Johnson explains print-out.

Memory tapes supply data on metal such as that shown below.



By DARRELL BARTEE

DESIGN ENGINEERS seeking the most efficient materials for their flight vehicles now look to the electronic computer for a quick assist.

Exotic metals and tricky alloys have been developed to meet the complex demands of supersonic aircraft, missiles and space designs. But the selection of the right materials for critical components is often a tedious and time-eating task.

Boeing's Wichita research engineers in the Military Aircraft Systems Division have devised a method of getting the right answers at electronic speed. Magnetic tapes in an IBM 7090 computer do most of the work in a matter of minutes.

The system is basically a memory-tape storage procedure, in which the variables of a problem are checked against the computer memory, and the data applicable to that problem are applied to provide the answer.

The original work on the system was done by Boeing for the Materials Central group, Wright Air Development Division, Air Research and Development Command, U. S. Air Force. This first step for ARDC covered the memory-tape storage of the data in Military Handbook No. 5, the official authority on aircraft metals.

Boeing engineers in the stress research and development group at Wichita, led by Howard W. Smith, recognized the potential value of the system to design personnel. It



Carl Isaacs works on computer code.

has emerged as a going engineering service at the Kansas plant.

Recently an engineering unit requested information as follows: "We need a material which would result in a maximum ultimate allowable bearing stress-to-density ratio, with an ultimate bearing stress greater than 58,000 psi and a coefficient of thermal expansion between .000004 and .000008 inches per inch per degree F." The new system promptly produced the answer on a computer print-out, easily readable to those familiar with the symbols.

In another instance, the question was: what are the three best sheet materials on a strength-weight basis for tensile yield strength at 500 degrees F? A fast and accurate answer gave the design unit a notable lift in search time.

Design engineers query the system by stating their question and supplying a set of controlling facts. The data is programmed for transfer in symbolic language to IBM cards, and then to magnetic tape. This is translated into machine language for the computer.

When this tape is used as input for the 7090, together with the memory tape which bears the data on characteristics of available metals, a resulting tape calls out the answers required.

The answer tape serves as input to an IBM 1401 computer which supplies the print-out answers. Currently, the memory tape based on the handbook covers some 100 metals and alloys, including aluminum, magnesium, steel, titanium and others. ➤



GIVES MORE THAN MILK

By DONALD BRANNON

A VACUUM PUMP which formerly milked cows now aids fabrication of printed electronic circuit cards at Boeing's Transport Division in Renton, Washington. The switch from cow barn to laboratory results from the ingenuity of a member of the electronics group.

This group produces components for test equipment and computers. The components include printed circuit cards to which electronic components are attached.

Cards are made by exposing a sensitized copper-coated fiberglass plate through a photographic negative of a circuit drawing. Etching and cleaning processes then remove

the excess metal, leaving copper circuits matching the drawing.

To obtain the required precise lines on the plate, the negative must press tightly against it during exposure. This is accomplished by sealing plate and negative in a plastic bag and exhausting the air. Available laboratory vacuum pumps failed to meet speed and load requirements.

The problem was solved by Ramon Lubovich, who lives on a farm near Seattle. He formerly kept a small herd of dairy cattle and was familiar with the high-vacuum capacity of a milking machine. Result: the erstwhile farm implement now provides better and faster circuit-card production. ➤

Educators and their students are alerted to what will face graduates.

CERTAIN MEN WANTED

By FRED G. HULEEN
Boeing Director of Personnel

WHAT AWAITS today's high-school or college student when he graduates and enters the business world? What yardsticks will be used to measure those graduates when they apply for work?

I believe industry will continue to look for the specialist; but the specialist is going to have to have a broader understanding of other aspects of business and life than are encompassed in his specialty. And he will have to be able to communicate his ideas and thoughts to other types of specialists.

High on my list is the need for a renewed sense of appreciation for English, science, the social studies and math. This is still a period of specialization, but too many of our specialists have discovered, to their regret (and to their employers' regret), that figuratively they were blinders during their school days. Future scientists had little time for the liberal arts, and those who were pointing to the arts and non-technical professions felt time spent in science classes was wasted. They both were wrong.

The freckle-faced boy and girl of 18 applying for their first jobs as riveters, clerks, or beginner mechanics are in for a surprise. While in school they thought, "I'll never need any of that stuff—English and math are for the birds."

The fact is that the so-called broad-base concept makes sense for all professions, all of the skills and all of the semi-skills. It is essential in order to adapt, to learn new skills, win promotions, or lead oth-

ers—including one's children—into a fuller life.

As a part of a broad base of understanding, industry would like its employees to have a better knowledge of what I choose to call the A-B-Cs of competitive economics. I know this has been said many times before; yet I would be remiss if I failed to point out that there is a real concern over the lack of economic understanding which leads a relatively high proportion of our population to think it can get something for nothing. These persons believe we can continue to take out of our economy more than we put into it, in terms of work, devotion to a cause, or for that matter even taxes. One of my friends in the communications business has described many of his company's new employees as being "economic illiterates."

Any discussion of industrial economics today leads to a discussion of unemployment. We read a great deal about men being out of work because changing industry no longer has places for them. But industry also is finding it exceedingly difficult to use the young man or woman fresh out of high school.

To find a permanent career in industry, a youth will find a growing necessity to have training beyond high school. He can continue through four or more years of college, or can take some form of specialized training which will equip him for a role of importance in industry.

Society in general, including education and business, needs a shoulder-to-the-wheel effort to stimulate student understanding of the oppor-

tunities in technician and technician-related work. A recent report to our Aero-Space Industries Association industrial relations subcommittee established, for instance, that there are about 30,000 qualified electronic-data programmers and systems analysts in the country today.

There will be a need within the next nine years for an estimated 500,000 persons with these skills.

Add to this figure the numbers of laboratory aides, engineering aides, staff assistants, electronic technicians and the like, who not only will be needed for expanding technical programs, but who could release persons with bachelor, master and doctoral degrees for the short-of-supply creative, exploratory and problem-solving assignments.

Fairly obvious, it would seem, is a necessity to convince students and their parents of the necessity and social worth of the light-blue to white-collar jobs, and to help strengthen and expand the nation's technical training institutions. A study entitled "The Technical Institute of America" which was made under the auspices of the American Society for Engineering Education says:

"Without question, the most serious general problem related to the technical institute student body is recruitment. Virtually all technical institutes have student-body capacity well beyond reported enrollments. Compounding the difficulties directly involved are misunderstanding and lack of knowledge about the nature and worth of technical institute education throughout the spectrum of society: employers,




engineers in practice, engineering educators, high school teachers and counselors, high school students, parents, and students at the collegiate level."

Related to the need for using technical institutes is a need to resell the true worth of every kind of job. In the philosophical sense, every work has dignity if it serves an essential need of man. Our young people in school and in business must be made to understand that they do not necessarily start with the so-called glamour jobs. It is essential that they roll up their sleeves and work their way up.

Industry has many obligations in its relations with employees. Fundamentally, it must look at the individual applying for work as an individual. It must treat him as such and recognize that he has needs which may differ from those of his fellows. In this connection Boeing constantly strives to improve methods for assessing individual aptitudes and to improve interviewing and counseling.

Education does not stop when a man or woman goes to work. We make available to our employees, and encourage them to use, voluntary off-hour training. This education is both formal and informal, in a range from blueprint-reading classes for beginners to assistance toward earning advanced college degrees.

Obviously we are as much concerned to hire and develop high-caliber employees as these young men and women are concerned to make successful careers. The sooner we understand each other's needs, the better we shall hit it off. 

ADVENTURES IN MANAGEMENT



FIDDLE-FOOTED MISSILEER

WORK YOURSELF out of a job—if you don't, you'll be stuck with the same one all your life.

This slightly cockeyed axiom has propelled Harvey Gunning from one Boeing division to another for the past 22 years.

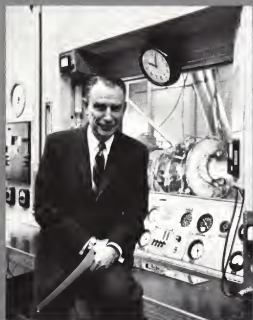
He preaches and practices, "Always build up your men." At present he is leveraging more and more responsibility onto his associates in the 3,700-man organization which he heads—with the idea, of course, of moving along and letting them go it alone.

Gunning, chief of the Aero-Space Division's systems test department, has charge of Boeing's missile testing at locations in Washington,

California and Florida. He is a civil engineer only because Mississippi State College didn't offer a degree in aeronautical engineering.

After graduation he practiced varying sorts of engineering with a southern creosote company, the Tennessee Valley Authority and a Chicago company, in addition to a stint as civil engineering instructor at his alma mater. His interest in aeronautics persisted and Gunning joined Boeing in 1940.

Gunning has a reputation as a "why" man. He also likes to ask, "Is this necessary?" He possesses a highly developed ability to predict probable effects of a given action and spot weaknesses in a new proposal. Many an engineer has



TURBINE WHEEL

SLENDER and dark haired, with his left arm in a plaster cast, a Boeing division manager faced his departmental executives across a conference table. One by one, he ticked off problems requiring solutions immediately or sooner; and with each new subject, faces of the men listening grew longer.

Then quite suddenly, Donald J. Euler paused, tapped the cast and looked around the table. His voice changed tone. "I'll bet," he said, "that you wish right now I'd broken my jaw instead of my arm."

The broken arm was the result of a home accident, and of importance only as a nuisance; but the statement to assembled executives indicated the empathy which

is characteristic of the long-time business planner and trouble shooter who now heads the Boeing Industrial Products Division as a company vice-president. His job is to keep The Boeing Company out front in the highly competitive field of small gas-turbine engines.

To this assignment in 1961, Euler brought an engineering degree from the University of Washington and some 32 years of Boeing experience. Euler was Boeing chief of preliminary design in 1942, assistant to the senior vice-president during the critical post-war period, and later corporate director of planning. He had a major hand in planning for multi-million-dollar company facilities to make possible Boeing's

LETTERS TO THE EDITOR

seen his brainchild dissected by Gunning, and most regard his criticisms as constructive.

At Boeing Gunning has grown up with the missile and space-vehicle portion of the business—skipping from one job to another as fast as he could work out of them. One assignment was as chief of wind-tunnel operations. Others were for Bomarc, Dyna-Soar (now the X-20), program development and orbital weapons systems.

"He has a double-barrelled ability," says an associate. "He gets good performance from men whose work in the past has been only average, and he solves complicated technical problems within limits of available time and funds." ✍

strong entry into missile, space vehicle and similar fields.

Perhaps more important, Euler acquired a keen awareness of the effectiveness of a team effort—and a curious golfing reputation; his game is steady and unspectacular, but his putter is deadly.

Soft-spoken and gentlemanly, Euler is nonetheless a realist—his stated objective for the Industrial Products Division and its turbine engine programs is the ultimate in simplicity: "To pick up the money, marbles and chalk."

One associate says, "When I think of Don Euler, I think of integrity, both personally and in business."

Another thinks of his putter. ✍

[In our July issue we wrote "... we need some tall-domed genius to tell us how to get from airport into town without crawling in earth-bound traffic." Two comments follow.]

☆☆☆

CRAWL NO MORE

I'm the tall-domed genius—

1. Promote downtown heliports.
2. Sell Boeing Vertol 107 helicopters.

Gordon Shook, Manager
Tower Life Building
San Antonio, Texas

Get World's Fair monorail extended via Boeing Field to Seattle-Tacoma Airport.

Will Lindley, Publicity Dept.
University of Puget Sound
Tacoma, Washington

☆☆☆

MACARTHUR'S B-17

In the Boeing Magazine, April, 1962, you carried an article describing some classic old B-17s which are still in use. Among these you included reference to Air Force serial number 44-835631 which you stated was the airplane which General MacArthur used throughout most of his Far East campaigns.

Although the article was quite interesting, I am sure you would not want to be in error in some of your assumptions. The airplane to which you had reference was not used by General MacArthur at any time during his campaigns. I was fortunate in having flown him from 1942 to his arrival in Tokyo, and the B-17 which he used, according to

many entries in my pilot's log, was serial number 412593.

W. E. Rhoades,
Vice-President
United Air Lines

☆☆☆

JET STAMPS

Some time ago in the public library in Minneapolis I read a copy of your magazine which I thought was very interesting and most informative. I would like to receive this magazine. If there is a charge, I would be more than willing to subscribe to it.

My hobby is collecting jet aircraft on stamps. Currently the Boeing 707 has appeared on 58 stamps and 3 items of airletters from 27 countries of the world.

The 707 leads its closest competitor on stamps by a two-to-one margin.

Lawrence De Mars
Spencer, Iowa

☆☆☆

COMMUNICATORS' CONFERENCE

May I extend my congratulations, along with many others, for winning an award for outstanding publication work in 1961.

On October 23, 1962 the Industrial Editors Association of Chicago is holding its Midwest Conference at the Sheraton-Blackstone Hotel. An important part of the conference will be an exhibit of outstanding communication tools. I would like very much to include a copy of Boeing Magazine.

Josephine Rathje,
Personnel Manager
Mutual Trust Life
Insurance Co.



People who often fly jets  ...most often fly Boeing

Their choice is made from experience. They know and enjoy the quiet, restful comfort of Boeing jetliners, the wonderful feeling of arriving refreshed. Experienced travelers have learned the value of the extra time, convenience

and comfort Boeing jets give them. Take their tip on your next trip. Wherever you're headed—to any one of 150 cities in the U.S.A. or 74 foreign lands—fly Boeing. More than 28,000,000 people like yourself already have.

BOEING Jetliners

LONG-RANGE 707 • MEDIUM-RANGE 720 • SHORT-RANGE 727

These airlines offer Boeing jetliner service: AIR FRANCE • AIR-INDIA • AMERICAN • AVIANCA • B.O.A.C • BRANIFF • CONTINENTAL • CUNARD EAGLE • EASTERN • EL AL • IRISH • LUFTHANSA • NORTHWEST • PACIFIC NORTHERN • PAKISTAN • PAN AMERICAN • QANTAS • SABENA • SAUDI ARABIAN • SOUTH AFRICAN • TWA • UNITED • VARIG and WESTERN. Boeing jets go into service later with: ETHIOPIAN.



Air Express celebrates its 35th anniversary.

ANYTHING GOES



By CHESTER CHATFIELD

BACK IN 1927 the American Railway Express Company took a look at shipping by air and decided it could be a business instead of a publicity gimmick. Men thought big in those boom days of the late 20s—maybe even big enough to foresee Air Express revenue of some \$51,000,000 annually by 1961.

Cal Coolidge was in the White House and all was well with the world when scheduled transcontinental Air Express got off the

ground on September 1, 1927. At least four shoebox-size packages were loaded in the freight compartment of a Boeing 40, operated by Boeing Air Transport between San Francisco and Chicago. Flashbulbs would have popped, but they hadn't been invented yet. Fortunately sunshine and optimism were everywhere, leading photographers to record the event.

The nice thing about Air Express was that it worked. From a cautious beginning when most air shipments were made to meet emergencies, businessmen moved on to the happy

discovery that here was a way to make higher profits on a lot of items.

The Air Express people learned some things also. They started out with a published list of cargo they would not accept, including any item in excess of 200 pounds. Today anything goes (almost anything, hastily amends the Air Express man—he will take a crated crocodile, but is doubtful about elephants).

Air Express is a service offered jointly by R E A Express, which provides the ground handling, and

37 U.S. scheduled airlines. The express company picks up the package from the shipper, in any one of 23,000 towns across the nation, and it goes by the fastest means all the way to the door of the receiver. The package may move part way by truck or railroad, but most likely will travel the greatest distance by Boeing jet aircraft, at something near 600 miles an hour.

Often in New York delivery is further speeded by a ride on one of New York Airways' Boeing Vertol helicopters.

The whole 35-year history of Air

Express is linked with Boeing transport aircraft. Present operations of Air Express are carried on 24 hours a day, 7 days a week, in all 50 of the United States and to and from Canada and Puerto Rico.

Shipments go out on the first flight having capacity available, regardless of airline. More than 10,000 daily flight departures carry air express. After passengers and mail, express has top priority over all other cargo.

Many articles shipped by Air Express are perishable, such as radioactive isotopes, biologicals,

serums, Hawaiian orchids and Maine lobsters.

One classification listed as perishable is surprising—women's style apparel. A new hat or dress placed on display a day, or hours, ahead of a competitor gets the buyer's attention first and often commands a premium. Flowers on the hat are not perishable, but the price of it may be.

The adaptability of Air Express men is incalculable. They have sent word that their refusal to fly an elephant is not absolute. They might consider a small one. ➔



In early days an airplane, train and truck could meet to transfer Air Express shipments.



Boeing 40 is loaded on first day of Air Express operation, September 1, 1927.

